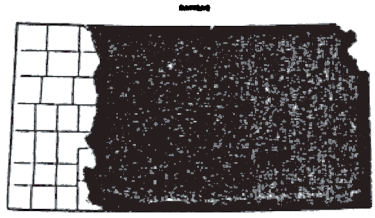
LIMY UPLAND

KANSAS RANGE SITE DESCRIPTION

1. Location of Site:



Land Resource Areas 72 and 77
Central High Table Land and
Southern High Plains

2. Climate:

See climate for LRA's 72 and 77
(Filed in the front of Section II-E)

3. Topography:

This site occurs on nearly level to steeply sloping uplands or high terraces.

4. Soils and Hydrological Characteristics:

a. This site consists of deep or moderately deep upland soils with silty or loamy surface layers and subsoils. Most of the soils have weakly calcareous to strongly calcareous surface layers and calcareous subsoils.

b. The major soils that characterize this site are:

Campus	Mansic
Colby	Mansker
Elkader	

c. Soil erosion on this range site by wind and water is a severe hazard if the vegetation is overgrazed or mismanaged. Livestock trailing often leads to the formation of gullies.

5. Climax Vegetation:

a. The natural potential vegetation of this site is a mixed grass prairie. Little bluestem, big bluestem, and sideoats grama are the dominant species in this condition. Combined they will make up about 60 percent of the total annual yield. The site has a diverse forb population most of which occurs in small amounts.

In its development, the vegetation on this site was greatly influenced by grazing and occasional wildfires. The grazing was predominantly by large transient herds of bison and lesser numbers of elk and antelope.

b. Guidelines for Determining Range Condition:

(Percentage of total production by weight)

Grasses and Grasslike - 90 Percent			Forbs - 10 Percent			Shrubs and Cacti - T
	15	big bluestem		blacksamson		leadplant
60	30	little bluestem		catclaw sensitivebriar		pricklypear
	25	sideoats grama		dotted gayfeather	T	red sage
				heath aster		winterfat
	10	blue grama		scarlet globemallow		yucca
20	5	green needlegrass		serrateleaf eveningprimrose		
	5	switchgrass	10	slimflower scurfpea		
	5	western wheatgrass		stiff glodenrod		
				upright prairieconeflower		
5		buffalograss		western ragweed		
		hairy grama				
		plains muhly		Astragalus sp.		
				nineanther dalea		
		perennial threeawns	T	prairie sunflower		
5		sand dropseed		purple prairieclover		
		tall dropseed		skeletonplant		

c. Invaders common to this site include Japanese brome, annual broomweed, broom snakeweed, fall witchgrass, horseweed, prairie threeawn, silver bluestem, and western salsify.

6. Management Implications:

This site generally occurs on the more sloping parts of the landscape.

The flatter slopes of this site and adjacent more level sites are preferred by livestock which can lead to a grazing distribution problem. Water locations, salt placement, and other aids help distribute grazing on this site. Other management techniques such as concentrated grazing and/or grazing systems also help distribute grazing more evenly. In order to properly use adjacent sites, portions of this site, the steeper areas, may have to be underutilized

With overgrazing big bluestem rapidly loses its productive capacity through loss of vigor and reproductive potential. Little bluestem and sideoats grama initially increase to fill the voids left by big bluestem decreasing. Continued overgrazing results in a decrease of little bluestem followed by sideoats grama. Blue grama and buffalograss increase as the taller grass species decline.

Erosion in the form of gullying and terracettes (contour trailing of livestock) on the steeper portion of the site will generally occur if continued overuse is practiced.

The preferred grass species generally escape excessive grazing pressure on the steeper less accessible areas. These steep areas help provide a source for the better forage plants after long periods of drought and/or overgrazing. The use of grazing management that includes needed distributional tools, proper stocking, and scheduled rest periods during the growing season, helps restore this site to its productive potential.

7 Wildlife Considerations:

When maintained in good to excellent condition, the flatter slopes of this site provide excellent habitat for ground nesting birds, rodents, foxes, and coyotes. It is also a preferred feeding area for deer. The variety of grasses and forbs found on this site provides the basic ingredients for a large food chain in and around this site.

The wind updrafts from associated hills and the abundance of small animals makes this a favorite soaring and feeding area for raptors.

Management that favors the preferred forage species along with a good mixture of forbs is advantageous to a large variety of wildlife species.

8. Other Uses and Values:

The sloping portions of this site provide a colorful and rustic landscape desired by many people. The less sloping portions are often used for cropland.

The subsoil material is often excavated and used for road-base material.

9. Herbage Production Guidelines:

The following guidelines are based on available clipping data when this site is in excellent condition. Vigor of principal forage species, time of burning, if fire is used, as well as growing conditions, influence annual herbage production.

	Total Air Dry Herbage	
Growing Conditions	Pounds/Acre	Kilograms/Hectare
Favorable	2,400-3,200	2,700-3,600
Normal	1,400-2,400	1,600-2,700
Unfavorable	800-1,400	900-1,600

10. Guide to Initial Stocking Rates:

Range Condition	Percent Climax Vegetation	Acres/AU Yearlong	AU Months Per Acre	Hectares/AU Yearlong	AUM's per Hectare
Excellent	76-100	18-22	.6	7-9	1.5
Good	51-75	22-27	.5	9-11	1.25
Fair	26-50	27-35	.4	11-14	1.0
Poor	0-25	35+	.3	14+	0.75

These guidelines are considered safe initial stocking rates from which a sound management program can be built. Grazing only during the dormant season or use of a specialized grazing program will usually allow a substantial increase in the stocking rates shown.

This site is not normally used for hay production.

11. Relative Preference of Plant Species:

Preferences of plant species by classes of livestock and uses by wildlife will vary from year to year and season to season. The table below is what might be expected under average climatic conditions and good management.

Forage Preferences	Wildlife Preferred Uses
H = High	C = Cover
M = Medium	F = Food
L = Low	N = Nesting

Plant Species	Animal Species			
	Cattle	Antelope	Deer	Pheasant
ashy sunflower	L	F	F	F
big bluestem	H	C	C	C,N
blacksamson	L	F	F	F
blue grama	H			
buffalograss	H	---	---	---
dotted gayfeather	M	F	F	---
heath aster	H	F	F	F
Japanese brome	M 1/	F 1/	F 1/	F 1/
leadplant	H	H	H	F,C
little bluestem	H	C	C	C,N
sand dropseed	M	C	C	C,N
sideoats grama	H	---	---	C
slimflower scurfpea	L	F	F	F
switchgrass	H 2/	---	---	C,F,N
tall dropseed	M	C	C	C,N
western ragweed	M	F	F	F
western wheatgrass	H	---	---	C,N
yucca	L	---	---	---

1/ Has a high preference during lush growth periods.

2/ Preferred during first half of growing season.

Reference:

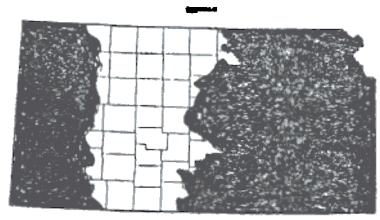
Anderson, Kling L. and Clenton E. Owensby. 1969 Common Names of a Selected List of Plants. Kansas State University Tech. Bul. 117.

LIMY UPLAND

KANSAS RANGE SITE DESCRIPTION

1. Location of Site:

Land Resource Areas 73, 78, and 79
Rolling Plains and Breaks,
Central Rolling Red Plains, and
Great Bend Sand Plains



2. Climate:

See climate for LRA's 73, 78, and 79
(Filed in the front of Section II-E)

3. Topography:

This site is on nearly level to steeply sloping uplands or high terraces where no extra moisture from drainage or overflow is received.

4. Soils and Hydrological Characteristics:

a. This site consists of deep or moderately deep upland soils that have silty or loamy surface layers. Most of the soils have weakly calcareous to strongly calcareous surface layers and calcareous subsoils.

b. The major soils that characterize this site are:

Armo	Coly
Brownell	Corinth
Campus	Nibson
Case	Penden
Clark	Wakeen

Soil erosion on this range site by wind and water is a severe hazard if the vegetation is overgrazed or mismanaged. Livestock trailing often leads to the formation of gullies.

5. Climax Vegetation:

a. The natural potential vegetation of this site is a mixed grass prairie. Big bluestem, little bluestem, and sideoats grama are the dominant species in this condition. Combined they will make up about 65 percent of the total production. Although western ragweed is the dominant forb on this site, it is not as prevalent as on associated sites. This site has a diverse variety of forbs most of which occur in relatively small amounts.

In its development, the vegetation on this site was greatly influenced by grazing and occasional wildfires. The grazing was predominantly by large transient herds of bison and lesser numbers of elk and antelope.

b. Guidelines for Determining Range Condition:

(Percentage of total production by weight)

Grasses and Grasslike - 90 Percent			Forbs - 10 Percent		Trees, Shrubs and Cacti - T
65	50	big bluestem	ashy goldenrod		Arkansas rose
	20	little bluestem	blacksamson echinacea		bur oak
	20	sideoats grama	catclaw sensitivebriar	T	leadplant
10	5	indiangrass	dotted gayfeather	10	pricklypear
	5	switchgrass	heath aster		small soapweed
	5	tall dropseed	purple prairieclover		
	5	western wheatgrass	serrateleaf eveningprimrose		
15	15	blue grama	slimflower scurfpea		
	5	buffalograss	stiff goldenrod		
T		Canada wildrye	western ragweed		
		hairy grama	babywhite aster		
		plains muhly	broom snakeweed		
		sand dropseed	daisy fleabane		
			fremont clematis	T	
			Louisiana sagewort		
			nineanther dalea		
			scarlet globemallow		
			silktop dalea		
			white prairieclover		

c. Invaders common to the site are Japanese brome, little barley, tansymustard, wild lettuce, silver bluestem, flannel mullein, and windmillgrass.

6. Management Implications:

This site generally occurs just above the breaks of hills where it is gently sloping and below the break where it is gently sloping to steep.

The flatter slopes of this site are preferred by livestock which often leads to grazing distribution problems. Water locations, salt and mineral placement, and other distribution tools are often needed to distribute grazing uniformly over this site. Other management techniques such as concentrated grazing and/or grazing systems also help. In extreme cases the limited use of fire may improve grazing on the more inaccessible areas. However, fire should only be used on the higher condition and more intensively managed areas.

Big bluestem rapidly loses its productive capacity with continuous overgrazing. Little bluestem and sideoats grama initially increase to fill the voids left by big bluestem. With continuous heavy grazing pressure both little bluestem and sideoats grama will also decrease. Blue grama and buffalograss increase as the taller grasses decline. Continued excessive overuse creates a "shortgrass pasture" aspect on this range site.

Erosion in the form of gullying and terracettes (contour trailing by livestock) on the steeper portion of the site will generally occur if continued overuse is practiced.

On the steeper, less accessible areas, the preferred grass species generally escape excessive grazing pressure. This feature provides a source for the better forage plants after long periods of drought and/or overgrazing. The use of grazing management that includes needed distributional tools, proper stocking, and scheduled rest periods, during the growing season, will help to restore this site to its productive potential.

7 Wildlife Considerations:

When maintained in good to excellent condition the less sloping portions of this site provide excellent habitat for ground nesting birds, rodents, foxes, and coyotes. It is also a preferred feeding area for mule deer. The variety of grasses and forbs found on this site provides a large food chain in and around this site.

The wind updrafts from associated hills and the abundance of small animals make this a favorite soaring and feeding area for raptors.

Management that favors the preferred species along with a good variety of forbs is advantageous to a large variety of wildlife species.

8. Other Uses and Values:

The sloping portions of this site provide a colorful but rustic vista. The less sloping portions are often used for cropland.

The subsoil material, caliche, is often used for road-base material

9. Herbage Production Guidelines:

The following guidelines are based on available clipping data when this site is in excellent condition. Vigor of principal forage species, time of burning, if fire is used, as well as growing conditions, influence annual herbage production.

Growing Conditions	Total Air Dry Herbage Pounds/Acre	Total Air Dry Herbage Kilograms/Hectare
Favorable	3,000-4,000	3,350-4,500
Normal	2,200-3,000	2,450-3,350
Unfavorable	1,000-2,200	1,100-2,450

10. Guide to Initial Stocking Rates:

Range Condition	Percent Climax Vegetation	Acres/AU Yearlong	AU Months Per Acre	Hectares/AU Yearlong	AUM's per Hectare
Excellent	76-100	14-18	0.8	6-7	2.0
Good	51-75	18-25	0.6	7-10	1.5
Fair	26-50	25-35	0.4	10-14	1.0
Poor	0-25	35+	0.3	14+	0.75

These guidelines are considered safe initial stocking rates from which a sound management program can be built. Grazing only during the dormant season or use of a specialized grazing program will usually allow a substantial increase in the stocking rates shown.

This site is not normally used for hay production

11. Relative Preference of Plant Species

Preferences of plant species by classes of livestock and uses by wildlife will vary from year to year and season to season. The table below is what might be expected under average climatic conditions and good management.

Forage Preferences

H = High
M = Medium
L = Low

Wildlife Preferred Uses

C = Cover
F = Food
N = Nesting

Plant Species	Animal Species		
	Cattle	Deer	Pheasant
ashy goldenrod	L	F	---
big bluestem	H	C	C,N
blacksamson echinacea	L	---	F
blue grama	H	---	
buffalograss	H	---	---
dotted gayfeather	M	F	---
heath aster	M	F	F
Japanese brome	M 1/	F	F
leadplant	H	C,F	C,F
little bluestem	H	C	C,N
sand dropseed	M	---	C
sideoats grama	H	---	C
slimflower scurfpea	L	F	F
small soapweed	L	---	---
switchgrass	H 2/	C	C,F,N
tall dropseed	M	C	C,N
western ragweed	M	F	F
western wheatgrass	H	F	C,N

1/ Has a high preference during lush growth periods

2/ Preferred during first half of growing season

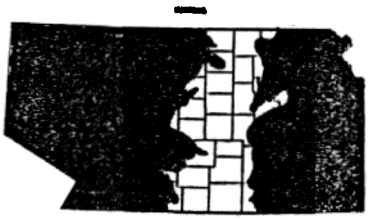
Reference:

Anderson, Kling L. and Clenton E. Owensby. 1969 Common Names of a Selected List of Plants. Kansas State University Tech. Bul. 117.

LIMY UPLAND

KANSAS RANGE SITE DESCRIPTION

1. Location of Site:



Land Resource Areas 74, 75, and 80A
Central Kansas Sandstone Hills,
Central Loess Plains, and
Central Rolling Red Prairies

2. Climate:

See climate for LRA's 74, 75, and 80A
(Filed in the front of Section II-E)

3. Topography:

This site is on moderately sloping or steeply sloping uplands with slopes up to 40 percent. In some areas limestone rock escarpments will be associated with this site.

4. Soils and Hydrological Characteristics:

a. This site consists of shallow to deep soils over calcareous shales or calcareous alluvium. All soils in this site have a moderately deep to deep rooting zone. These soils are fine to medium textured. They are frequently calcareous to the surface and always strongly calcareous within 10 inches of the surface. These soils are well drained. They have moderate to slow permeability. Total vegetative production in this rainfall belt is limited by low and moderate available water capacity and slope.

b. The major soils that characterize this site are:

Armo	Kipson
Case	Ost
Clark	Wakeen
Clime	

c. Gullying and sheet erosion are severe hazards on these highly erosive soils. Livestock trailing and excessive removal of the vegetation prior to spring growth contributes to this hazard.

5. Climax Vegetation:

a. The natural potential vegetation on this site is a mixed grass prairie. Big bluestem, little bluestem, indiangrass, and sideoats grama make up about 75 percent of the potential vegetation on this site. In its development, the vegetation on this site was influenced by fire, grazing, and drought. The grazing was predominately by large transient herds of bison and lesser numbers of antelope, elk, and deer.

b. Guidelines for Determining Range Condition:

(Percentage of total production by weight)

Grasses and Grasslike - 90 Percent			Forbs - 10 Percent		Shrubs and Cacti - T
75	40	big bluestem	aromatic aster		aromatic sumac
	10	indiangrass	blacksamson echinacea		buckbrush
	25	little bluestem	buttonsnakeroot eryngo		leadplant
	15	sideoats grama	catclaw sensitivebriar	T	pricklypear
			cobea penstemon		roughleaf dogwood
10		switchgrass	common breadroot scurfpea		small soapweed
		western wheatgrass	common eveningprimrose		smooth sumac
			compassplant		
		blue grama	dotted gayfeather		
		buffalograss	false boneset		
		Canada wildrye	groundplum milkvetch		
		hairy grama	heath aster		
5		plains muhly	Louisiana sagewort		
		purple lovegrass	manyflower scurfpea		
		ring muhly	10 maximilian sunflower		
		rosette panicums	Missouri eveningprimrose		
		sedges	Missouri goldenrod		
		tall dropseed	pitcher sage		
		Virginia wildrye	prairieconeflower		
			purple prairieclover		
			rose verbena		
			roundhead prairieclover		
			serrateleaf eveningprimrose		
			slimflower scurfpea		
			spiderwort		
			stiff goldenrod		
			stiff sunflower		
			western ragweed		
			white prairieclover		
			willowleaf sunflower		
			yarrow		

c Common invaders to this site include annual broomweed, Japanese brome, Kentucky bluegrass, osageorange, prairie threeawn, redcedar, silver bluestem, and windmillgrass.

6. Management Implications:

This site appears on sloping upland throughout central Kansas. Topography plays a major role in the management of this site. Moderately sloping areas are readily grazed by livestock while steep slopes will frequently be only lightly grazed. Obtaining proper grazing distribution is a major concern on this site. Water location, salt and mineral placement, proper fence location, and specialized grazing systems are tools used to get adequate distribution of grazing.

Overgrazing with cattle will result in big bluestem, indiangrass, and switchgrass responding as the major grass decreasers. Little bluestem is the major increaser initially but decreases with continued overuse. Sideoats grama, hairy grama, tall dropseed, Louisiana sagewort, Missouri goldenrod, heath aster, aromatic aster, aromatic sumac, and western ragweed are other principal increasers. Severe overgrazing with cattle results in bluegrama, buffalograss, hairy grama, threeawns, Japanese brome, and weedy forbs dominating the site.

Sheep readily graze most of the forbs and shrubs on this site. Overgrazing with sheep will result in the rapid reduction of the forbs and shrubs. Continued overgrazing finally results in only prairie threeawn and remnants of tall dropseed remaining on this site.

Grazing management that includes proper stocking, scheduled rest periods, and distributional aids are effective in restoring and maintaining the vegetation on this site.

7 Wildlife Considerations:

This site is utilized by practically all upland wildlife species found in mixed grass prairie habitats. The wide variety of forbs and grasses makes this one of the preferred grazing areas for deer. Prairie chickens use this site for feeding, nesting, and loafing cover. Because of the associated low growing shrubs often found on this site, quail, rabbits, and numerous songbirds frequent this site.

Management for maximum diversity of grasses, forbs, and shrubs will benefit the greatest number of wildlife species. Good grazing management helps maintain the productivity and diversity of plant and animal species on this site.

8. Other Uses and Values:

This site is one of the most visually attractive to visitors and residents alike due to its topography and diversity of plants. The sloping portions of this site provide a colorful but rustic vista. The less sloping portions are often tilled for cropland.

The subsoil material from this site may be used for road-base material.

9. Herbage Production Guidelines:

The following guidelines are based on available clipping data when this site is in excellent condition. Vigor of principal forage species, proper burning techniques, if used, as well as growing conditions, influence annual herbage production.

Growing Conditions	Total Air Dry Herbage Pounds/Acre	Kilograms/Hectare
Favorable	4000-5000	4500-5600
Normal	3000-4000	3350-4500
Unfavorable	2000-3000	2250-3350

10. Guide to Initial Stocking Rates:

Range Condition	Percent Climax Vegetation	Acres/AU Yearlong	AU Months Per Acre	Hectares/AU Yearlong	AUM's Per Hectare
Excellent	76-100	10-	1.0	4-6	2.5
Good	51-75	14-	.8	6-7	2.0
Fair	26-50	18-	.5	7-10	1.25
Poor	0-25	30	.3	10+	0.75

These guidelines are considered safe initial stocking rates from which a sound management program can be built. Grazing only during the dormant season or use of a specialized grazing program may allow an increase in the stocking rates shown.

When maintained in good to excellent condition, an average hay yield of approximately 1.0 ton per acre can be expected from this site.

11. Relative Preference of Plant Species:

Preferences of plant species by classes of livestock and uses by wildlife will vary from year to year and season to season. The table below is what might be expected under average climatic conditions and good management.

Forage Preferences

H = High
M = Medium
L = Low

Wildlife Preferred Uses

C = Cover
F = Food
N = Nesting

Plant Species	Animal Species			
	Cattle	Sheep	Deer	Pheasant
big bluestem	H	M	C	C,N
blacksamson echinacea	M	M	---	F
blue grama	H	H	F	---
Canada wildrye	H	H	F	C,F
catclaw sensitivebriar	H	H	F	F
compassplant	H	H	F	F
dotted gayfeather	M	M	---	---
hairy grama	L	M	---	---
heath aster	M	H	F	C
Japanese brome	M 1/	H 1/	F	F
indiangrass	H	H	C	C,N
leadplant	H	H	F	C
little bluestem	H	M	C	C,N
maximilian sunflower	H	H	F	C,F
sideoats grama	H	M	F	C,N
switchgrass	H 2/	L	C	C,F,N
western ragweed	M	M	F	C,F
western wheatgrass	H	M 1/	F	C,N

1/ Has a high preference during lush growth periods

2/ Preferred during first half of growing season

Reference:

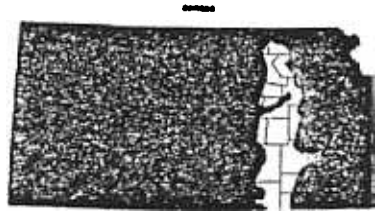
Anderson, Kling L. and Clenton E. Owensby. 1969 Common Names of a Selected List of Plants. Kansas State University Tech. Bul. 117.

LIMY UPLAND

KANSAS RANGE SITE DESCRIPTION

1. Location of Site:

Land Resource Area 76
Bluestem Hills (Flint Hills)



2. Climate:

See climate for LRA 76
(Filed in the front of Section II-E)

3. Topography:

Moderately sloping to steeply sloping uplands with slopes up to 40 percent. In some areas steep slopes and limestone rock escarpments will be associated with this site.

4. Soils and Hydrological Characteristics:

a. Moderately deep and shallow soils over calcareous shales. These soils are fine to medium textured. They are frequently calcareous to the surface and always strongly calcareous within 10 inches of the surface. These soils have a good infiltration rate and internal drainage. Total vegetative production in this rainfall belt is limited by low and moderate available water capacity and slope.

b. The major soils that characterize this site are Clime and Kipson

c. Gullying and sheet erosion are severe hazards on these highly erosive soils. Livestock trailing and excessive removal of the vegetation prior to spring growth contributes to this hazard.

5. Climax Vegetation:

a. The natural potential vegetation on this site is a tall grass prairie. However, it supports slightly greater percentages of mid and short grasses and forbs than most of the other range sites in the Flint Hills. Big bluestem, little bluestem, indiangrass, switchgrass, and sideoats grama make up about 75 percent of the potential vegetation on this site. In its development, the vegetation on this site was influenced by fire, grazing, and drought. The grazing was predominately by large transient herds of bison and lesser amounts of elk and deer.

b. Guidelines for Determining Range Condition:

Percentage of total production by weight)

Grasses and Grasslike - 80 Percent			Forbs - 15 Percent		Shrubs - 5 Percent	
	30	big bluestem		blacksamson		ceanothus
60	30	little bluestem		buttonsnakeroot eryngo	5	leadplant
	10	indiangrass		catclaw sensitivebriar		prairie rose
				cobea penstemon		
	10	sideoats grama		common breadroot scurfpea		aromatic sumac
15	10	switchgrass		compassplant	T	roughleaf dogwood
				fringeleaf ruellia		smooth sumac
		blue grama		groundplum milkvetch		
		buffalograss		pale echinacea		
		Canada wildrye	10	pitcher sage		
		hairy grama		purple prairieclover		
5		plains muhly		roundhead lespedeza		
		purple lovegrass		roundhead prairieclover		
		ring muhly		silky aster		
		rosette panicums		silky prairieclover		
		sedges		spiderwort		
		Virginia wildrye		stiff sunflower		
				tall gayfeather		
				white prairieclover		
				willowleaf sunflower		
				aromatic aster		
				boneset		
				butterfly milkweed		
				common eveningprimrose		
				dotted gayfeather		
				false boneset		
				heath aster		
				Louisiana sagewort		
				Missouri eveningprimrose		
				Missouri goldenrod		
			5	narrowleaf milkweed		
				parthenium		
				plains larkspur		
				prairieconeflower		
				rose verbena		
				serrateleaf eveningprimrose		
				slimflower scurfpea		
				stiff goldenrod		
				western ragweed		
				white penstemon		
				whorled milkweed		
				yarrow		

c. Common invaders to this site include annual broomweed, buckbrush, Japanese brome, Kentucky bluegrass, osageorange, prairie threeawn, red cedar, and silver bluestem.

6. Management Implications:

This site appears on sloping uplands throughout the Flint Hills. Topography plays a major role in the management of this site. Moderately sloping areas are readily grazed by livestock while steep slopes will frequently be only lightly grazed. Obtaining proper grazing distribution is a major concern on this site. Water location, salt and mineral placement, proper fence location, prescribed burning, and specialized grazing systems are needed to get adequate distribution of grazing. The steeper areas are more prone to invasion by brush. Brush management frequently is needed on these areas before they can produce up to their potential. The use of properly timed spring burns can help reduce grazing distribution problems and maintain woody species at an acceptable level.

Overgrazing with cattle will result in big bluestem, little bluestem, indiangrass, and switchgrass responding as the major grass decreasers. The prairieclovers, roundhead lespedeza, catclaw sensitivebriar, compassplant, stiff sunflower, buttonsnakeroot eryngo, and tall gayfeather are a few of the forb decreasers. Leadplant, ceanothus, and prairie rose are shrub decreasers. Grazing with yearling cattle will generally result in leadplant responding as an increaser.

Sideoats grama, hairy grama, tall dropseed, western ragweed, Louisiana sagewort, Missouri goldenrod, stiff sunflower, heath aster, aromatic aster, aromatic sumac, smooth sumac, and roughleaf dogwood are some of the principal increasers. Severe overgrazing with cattle results in smooth sumac, aromatic sumac, roughleaf dogwood, buckbrush, red cedar, osageorange, annual broomweed, prairie threeawn, Japanese brome, silver bluestem, and tall dropseed becoming the dominant vegetation.

Sheep readily graze most of the forbs and shrubs on this site. Overgrazing with sheep will result in the rapid reduction of the forbs and shrubs. Continued overgrazing finally results in only prairie threeawn and remnants of tall dropseed remaining on this site.

Proper stocking, prescribed burning, grazing systems, and other distributional aids are effective in restoring and maintaining the vegetation on this site.

7 Wildlife Considerations:

This site is utilized by practically all upland wildlife species found in tall grass prairie habitats. The wide variety of forbs, grasses, and low growing shrubs makes this one of the preferred grazing areas for whitetail deer. Prairie chickens use this site for feeding, nesting, and loafing cover. Because of the associated low growing shrubs normally found on this site, quail, rabbits, and numerous songbirds frequent this site.

Management for maximum diversity of grasses, forbs, and preferred shrubs will benefit the greatest number of wildlife species. The use of prescribed burning and good grazing management helps maintain the productivity and diversity of plant and animal species on this site.

8. Other Uses and Values:

This site is one of the most attractive to visitors and residents alike due to its topography and diversity of plants. A larger variety and volume of forbs are produced on this site than any other in the Flint Hills. This array of flowering plants provides color from early spring to late fall. A number of species that occur regularly on this site are observed only infrequently or not at all on other range sites.

The variety of plants, color, and topography provides added value to this site. It is a perferred area for hikers, photographers, native plant collectors, and others who enjoy the outdoors.

9. Herbage Production Guidelines:

The following guidelines are based on available clipping data when this site is in excellent condition. Vigor of principal forage species, time of burning, if fire is used, as well as growing conditions, influence annual herbage production.

	Total Air Dry Herbage	
Growing Conditions	Pounds/Acre	Kilograms/Hectare
Favorable	4000-5000	4500-5600
Normal	3000-4000	3350-4500
Unfavorable	2000-3000	2250-3350

10. Guide to Initial Stocking Rates:

Range Condition	Percent Climax Vegetation	Acres/AU Yearlong	AU Months Per Acre	Hectares/AU Yearlong	AUM's Per Hectare
Excellent	76-100	10-14	1.0	4-6	2.5
Good	51-75	14-18	.8	6-7	2.0
Fair	26-50	18-24	.6	7-10	1.5
Poor	0-25	24+	.4	10+	1.0

These guidelines are considered safe initial stocking rates from which a sound management program can be built. Grazing only during the dormant season or use of a specialized grazing program may allow an increase in the stocking rates shown.

When maintained in good to excellent condition, an average hay yield of approximately 1.0 ton per acre can be expected from this site.

11. Relative Preference of Plant Species:

Preferences of plant species by classes of livestock and uses by wildlife will vary from year to year and season to season. The table below is what might be expected under average climatic conditions and good management.

Forage Preferences

H = High
M = Medium
L = Low

Wildlife Preferred Uses

C = Cover
F = Food
N = Nesting

Plant Species	Animal Species			
	Cattle	Sheep	Deer	Quail
big bluestem	H	M	C	C,N
blacksamson	M	M	---	---
blue grama	H	H	F	---
Canada wildrye	H	H	F	F,C
catclaw sensitivebriar	H	H	F	F
ceanothus	H	H	F,C	C
compassplant	H	H	F	F
dotted gayfeather	M	M	---	---
hairy grama	L	M	---	---
heath aster	M	H	F	C
indiangrass	H	H	C	C,N
leadplant	H	H	F	C
little bluestem	H	M	C	C,N
maximilian sunflower	H	H	F	F,C
roundhead lespedeza	H	H	F	F
sideoats grama	H	M	---	C,N
switchgrass	H 2/	L	C	C,F,N
western ragweed	M	M	---	F,C

1/ Has a high preference during lush growth periods.

2/ Preferred during first half of growing season.

Reference:

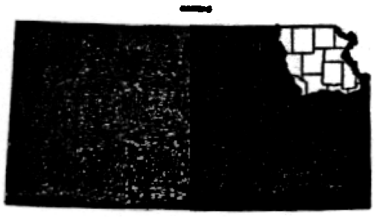
Anderson, Kling L. and Clenton E. Owensby. 1969 Common Names of a Selected List of Plants. Kansas State University Tech. Bul. 117.

LIMY UPLAND

KANSAS RANGE SITE DESCRIPTION

1. Location of Site:

Land Resource Area 106
Nebraska and Kansas Loess-Drift Hills



2. Climate:

See climate for LRA 106
(Filed in the front of Section II-E)

3. Topography:

Moderately sloping to steeply sloping uplands with slopes up to 50 percent. In some areas steep slopes and limestone rock escarpments will be associated with this site.

4 Soils and Hydrological Characteristics:

a. This range site consists of calcareous silty or loamy soils that are well drained or somewhat excessively drained. The soils are deep that developed in loess or glacial material, or they are 10 to 40 inches deep over shale. Vegetative production is limited by low available water capacity and/or by rapid runoff.

b. The major soils that characterize this site are:

Clime	Kipson
Hamburg	Steinauer

c. Gullying and sheet erosion are severe hazards on these highly erosive soils. Livestock trailing and excessive removal of the vegetation prior to spring growth contributes to this hazard.

5. Climax Vegetation:

a. The natural potential vegetation on this site is a tall grass prairie. However, it supports slightly greater percentages of mid and short grasses and forbs than most of the other range sites in the Loess-Drift Hills. Big bluestem, little bluestem, indiangrass, switchgrass, and sideoats grama make up about 75 percent of the potential vegetation on this site. In its development, the vegetation on this site was influenced by fire, grazing, and drought. The grazing was predominately by large transient herds of bison and lesser numbers of elk and deer.

b. Guidelines for Determining Range Condition:

(Percentage of total production by weight)

Grasses and Grasslike - 80 Percent			Forbs - 15 Percent		Shrubs - 5 Percent	
60	35	big bluestem		blacksamson echinacea		ceanothus
	25	little bluestem		buttonsnakeroot eryngo	5	leadplant
	10	indiangrass		catclaw sensitivebriar		prairie rose
				cobea penstemon		
15	10	sideoats grama		common breadroot scurfpea		aromatic sumac
	10	switchgrass		compassplant	T	roughleaf dogwood
				fringeleaf ruellia		smooth sumac
		blue grama		groundplum milkvetch		
		buffalograss		maximilian sunflower		
		Canada wildrye		pale echinacea		
		hairy grama	10	pitcher sage		
5		plains muhly		purple prairieclover		
		prairie junegrass		roundhead lespedeza		
		purple lovegrass		roundhead prairieclover		
		ring muhly		silky aster		
		rosette panicums		silky prairieclover		
		sedges		spiderwort		
		Virginia wildrye		stiff sunflower		
				tall gayfeather		
				white prairieclover		
				willowleaf sunflower		
				aromatic aster		
				boneset		
				butterfly milkweed		
				common eveningprimrose		
				dotted gayfeather		
				falseboneset		
				heath aster		
				Louisiana sagewort		
				manyflower scurfpea		
				Missouri eveningprimrose		
				Missouri goldenrod		
			5	narrowleaf milkweed		
				parthenium		
				plains larkspur		
				prairieconeflower		
				rose verbena		
				serrateleaf eveningprimrose		
				stiff goldenrod		
				western ragweed		
				white penstemon		
				whorled milkweed		
				yarrow		

c. Common invaders to this site include annual broomweed, buckbrush, Japanese brome, Kentucky bluegrass, osageorange, prairie threeawn, redcedar, and silver bluestem.

6. Management Implications:

This site is mainly located on the side slopes of the uplands. The slopes typically are 10 to 20 percent but range from 3 to 50 percent. Topography plays a major role in the management of this site. Moderately sloping areas are readily grazed by livestock while steep slopes will frequently be only lightly grazed. Obtaining proper grazing distribution is a major concern on this site. Water location, salt and mineral placement, proper fence location, prescribed burning, and specialized grazing systems are needed to get adequate distribution of grazing. The steeper areas are more prone to invasion by brush. Brush management frequently is needed on these areas before they can produce up to their potential. The use of properly timed spring burns can help reduce grazing distribution problems and maintain woody species at an acceptable level.

Overgrazing with cattle will result in big bluestem, little bluestem, indiangrass, and switchgrass responding as the major grass decreasers. The prairieclovers, roundhead lespedeza, catclaw sensitivebriar, compassplant, stiff sunflower, buttonsnakeroot eryngo, and tall gayfeather are a few of the forb decreasers. Leadplant, ceanothus, and prairie rose are shrub decreasers. Grazing with yearling cattle will generally result in leadplant responding as an increaser.

Sideoats grama, hairy grama, tall dropseed, western ragweed, Louisiana sagewort, Missouri goldenrod, stiff sunflower, heath aster, aromatic aster, aromatic sumac, smooth sumac, and roughleaf dogwood are some of the principal increasers. Severe overgrazing with cattle results in smooth sumac, aromatic sumac, roughleaf dogwood, buckbrush, redcedar, osageorange, annual broomweed, prairie threeawn, Japanese brome, silver bluestem, and tall dropseed becoming the dominant vegetation.

Sheep readily graze most of the forbs and shrubs on this site. Overgrazing with sheep will result in the rapid reduction of the forbs and shrubs. Continued overgrazing finally results in only prairie threeawn and remnants of tall dropseed remaining on this site.

Proper stocking, prescribed burning, grazing systems, and other distributional aids are effective in restoring and maintaining the vegetation on this site.

7 Wildlife Considerations:

This site is utilized by practically all upland wildlife species found in tall grass prairie habitats. The wide variety of forbs, grasses, and low growing shrubs makes this one of the preferred grazing areas for white-tail deer. Prairie chickens use this site for feeding, nesting, and loafing cover. Because of the associated low growing shrubs normally found on this site, quail, rabbits, and numerous songbirds frequent this site.

Management for maximum diversity of grasses, forbs, and preferred shrubs will benefit the greatest number of wildlife species. The use of prescribed burning and good grazing management helps maintain the productivity and diversity of plant and animal species on this site.

8. Other Uses and Values:

This site is one of the most attractive to visitors and residents alike due to its topography and diversity of plants. A larger variety and volume of forbs are produced on this site than any other in the Loess-Drift Hills. A number of species that occur regularly on this site are observed only infrequently or not at all on other range sites.

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	Total Air Dry Herbage	
Growing Conditions	Pounds/Acre	Kilograms/Hectare
Favorable	4500-5500	4900-6000
Normal	3500-4500	3800-4900
Unfavorable	2500-3500	2700-3800

10. Guide to Initial Stocking Rates:

Range Condition	Percent Climax Vegetation	Acres/AU Yearlong	AU Months Per Acre	Hectares/AU Yearlong	AUM's Per Hectare
Excellent	76-100	9-11	1.2	3-4	3.0
Good	51-75	11-15	1.0	4-5	2.5
Fair	26-50	15-20	0.7	5-7	1.7
Poor	0-25	20+	0.45	7+	1.1

These guidelines are considered safe initial stocking rates from which a sound management program can be built. Grazing only during the dormant season or use of a specialized grazing program may allow an increase in the stocking rates shown.

When maintained in good to excellent condition, an average hay yield of 1.0 to 1.25 tons per acre can be expected from this site.

Limy Upland LRA 106

11. Relative Preference of Plant Species:

Preferences of plant species by classes of livestock and uses by wildlife will vary from year to year and season to season. The table below is what might be expected under average climatic conditions and good management.

Forage Preferences	Wildlife Preferred Uses
H = High	C = Cover
M = Medium	F = Food
L = Low	N = Nesting

Plant Species	Animal Species			
	Cattle	Sheep	Deer	Quail
big bluestem	H	M	C	C,N
blacksamson echinacea	M	M	---	F
blue grama	H	H	F	---
Canada wildrye	H	H	F	C,F
catclaw sensitivebriar	H	H	F	F
ceanothus	H	H	F,C	C
compassplant	H	H	F	C,F
dotted gayfeather	M	M	---	---
hairy grama	L	M	---	---
heath aster	M	H	F	C
indiangrass	H	H	C	C,N
leadplant	H	H	F	C
little bluestem	H	M	C	C,N
maximilian sunflower	H	H	F	F,C
roundhead lespedeza	H	H	F	F
sideoats grama	H	M	---	C
switchgrass	H 1/	L	C	C,F,N
western ragweed	M	M	---	C,F

1/ Preferred during first half of growing season.

Reference:

Anderson, Kling L. and Clenton E. Owensby. 1969 Common Names of a Selected List of Plants. Kansas State University Tech. Bul. 117.